REMARKS

Claims 1 to 6 and 14 to 21 were pending in the above-identified application. Applicant has amended claims 1, 4, 15, and 21. Claims 1 to 6 and 14 to 21 remain pending.

§103 Rejections of Claims 1, 3 to 6, and 14

The Examiner rejected claims 1, 3 to 6, and 14 under 35 U.S.C. 103(a) as being unpatentable over by U.S. Patent No. 6,424,375 ("Fowler") in view of U.S. Patent No. 6,002,123 ("Suzuki").

Claim 1

Addressing claim 1, the Examiner stated:

> However, Fowler does not expressly teach that the reference voltage source generates a reset voltage that is independent of the supply voltage. In the same filed of endeavor, Suzuki teaches that the reference voltage source generates a reset voltage that is independent of the supply voltage (figs. 1-4; col. 3, line 45 – col. 4, line 23 and col. 4, lines 40 – 52). In light of the teaching of Suzuki, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the sensor of Fowler with a reference voltage source which generates a reset voltage that is independent of the supply voltage in order to prevent blooming thereby expanding the image sensor's dynamic range (Suzuki, col. 4, lines 31 – 39).
>
> *Note: Fowler incorporates a reference that teaches the plurality of row of pixels and a reset line as claimed above. That particular reference was provided in the previous Office Action.

February 9, 2006 Final Office Action, p. 4. Applicant respectfully traverses.

Amended claim 1 recites a "reference voltage source [that] generates a ground referenced reset voltage that is independent of the supply voltage." This reference voltage source is commonly understood to be referenced to ground and insensitive to the supply voltage. In other words, this reference voltage source provides a constant reference voltage relative to ground despite variations in the supply voltage (i.e., the reference voltage does not fluctuate with the supply voltage). This reference voltage source can be implemented with zener diodes and bandgap references as described in "The Art of Electronics" by Horowitz and Hill, Cambridge Press, 1989 (pp. 331 to 341). As discussed in the Summary, "because the reset signal level is independent of the supply voltage, a difference signal generated by an associated column circuit is substantially independent of variations in the supply voltage" and "[s]ince the rest signal level

does not substantially change between resets, noise caused by differences in reset signal level between resets is reduced or eliminated." Specification, p. 5.

Suzuki does not disclose a "reference voltage source [that] generates a ground referenced reset voltage that is independent of the supply voltage" as recited in amended claim 1. Suzuki simply discloses a reset line 16 that receives a reset voltage VRn having three voltage levels Vh, Vm, and Vl. Suzuki is silent as to the reference voltage source, whether supply dependent or independent and ground referenced or otherwise, that generates these three voltage levels. Suzuki, col. 4, lines 44 to 52. Therefore, Suzuki does not disclose a "reference voltage source [that] generates a ground referenced reset voltage that is independent of the supply voltage" as recited in amended claim 1.

Applicant notes that the Examiner did not respond to Applicant's previous argument that Fowler does not disclose or suggest how switch 122 can be modified to couple a reference voltage source (consisting of an operational amplifier 106 and a switch 120) to a reset line for multiple pixels. As can be seen in Fig. 1 of Fowler, switch 122 couples the reference voltage source to a reset line of a single photodiode 112. Carefully note that operational amplifier 106 has its inverted input coupled to a readout node 110 of photodiode 112 to provide a feedback path for that particular pixel. It is unclear how the feedback path would be modified to accommodate one reset line for multiple pixels without deviating from the operating principles of the original invention disclosed in Fowler. Any such modification would not be routine and would be inventive on the part of the Examiner.

The Examiner again cites an article by Tartagni et al., which is incorporated by reference in Fowler, to disclose a plurality of pixels and a single reset line. "A Fingerprint Sensor Based on the Feedback Capacitive Sensing Scheme" by Tartagni et al., IEEE Journal of Solid-State Circutis, Vol. 33, No. 1, January 1998. However, Tartagni et al. does not disclose or suggest how to modify Fowler so that switch 122 can couple a reference voltage source (consisting of an operational amplifier 106 and a switch 120) to a reset line for multiple pixels without deviating from the operating principles of Fowler.

Accordingly, the combination of Fowler and Suzuki does not disclose "a switching device selectively coupled to one of reset lines in the rows of pixels; and a reference voltage source coupled between a second ground and one of the reset lines via the switching device, wherein the reference voltage source generates a ground referenced reset voltage that is independent of the supply voltage" as recited in amended claim 1. If the Examiner disagrees, Applicant respectfully requests the Examiner to explain in detail how any of the references discloses or suggests a way to

modify Fowler so that switch 122 can couple a reference voltage source (consisting of an operational amplifier 106 and a switch 120) to a reset line for multiple pixels without deviating from the operating principles of Fowler.

Claims 3 to 6 and 14

Claims 3 to 6 and 14 depend from amended claim 1 and are patentable over the combination of Fowler and Suzuki for at least the same reasons as amended claim 1.

§ 103 Rejections of Claims 15 to 20

The Examiner rejected claims 15 to 20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,133,862 ("Dhuse et al.") in view of Suzuki.

Amended claim 15 recites "a ground referenced reset voltage that is independent of a supply voltage," which is not disclosed by Suzuki as discussed above in regards to amended claim 1. Amended claim 15. Accordingly, amended claim 15 is patentable over the combination of Dhuse et al. and Merrill et al. for at least the same reasons as amended claim 1.

Claims 16 to 20 depend from amended claim 15 and are patentable over the combination of Dhuse et al. and Merrill et al. for at least the same reasons as amended claim 15.

Allowable Subject Matter

Applicant thanks the Examiner for allowing claim 2 and indicating that claim 21 is allowable if rewritten in independent form including all the limitations of its base claim and any intervening claims.

Applicant has not amended claim 21 to independent form but instead Applicant relies on its dependence from base claim 1 for its patentability.

Summary

In summary, claims 1 to 6, 14 to 21 were pending in the present application. Applicant has amended claims 1, 4, 15, and 21. For the above reasons, Applicant respectfully requests the Examiner to withdraw her claim rejections and allow claims 1 to 6 and 14 to 21. Should the Examiner have any questions, please call the undersigned at (408) 382-0480x206.

I hereby certify that this paper is being Deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Signature

5/9/06
Date

Respectfully submitted,

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